wherein the optical pass-through system comprises at least one opening in the planarizing medium alignable with the illumination site on the table and at least one orifice in the backing pad at least partially aligned with the opening in the planarizing medium.

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47. (New) The polishing pad of claim 1 wherein the optical pass-through system comprises a plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, each hole being separately alignable with the illumination site according to the portion of the pad over the illumination site.

48. (New) The polishing pad of claim 1, further comprising an optically transmissive backing sheet having a top surface and an under surface, the planarizing medium being disposed on the top surface of the backing sheet, and wherein the optical pass-through system comprises a plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, each hole defining a separate view site.

49. (New) The polishing pad of claim 1, further comprising a backing pad having a top surface and an under surface, the planarizing medium being disposed on the top surface of the backing pad, wherein the optical pass-through system comprises a first plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, and the optical pass-through system further comprises a second plurality of holes in which each hole of the second plurality of holes is aligned with a corresponding hole of the first plurality of holes.

50. (New) The polishing pad of claim 1, further comprising an optically transmissive backing sheet having a top surface and an under surface, and wherein the planarizing medium is an abrasive layer having a resin and abrasive particles distributed in the resin, the planarizing medium being disposed on the top surface of the backing sheet.

51. (New) The polishing pad of claim 50 wherein the optical pass-through system comprises a plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, each hole being alignable with the illumination site as the pad incrementally moves over the table.

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52. (New) A polishing pad for chemical-mechanical planarization of microelectronic-device substrate assemblies, comprising:

an optically transmissive backing sheet having a top surface and an under surface;

a backing pad attached to the under surface of the backing sheet, the backing pad having at least one viewing port; and

a planarizing medium disposed on the top surface of the backing sheet, the planarizing medium having at least one viewing port at least partially aligned with the viewing port in the backing pad.

53. (New) The polishing pad of claim 52 wherein:

the at least one viewing port in the planarizing medium comprises a plurality of holes through the planarizing medium, the holes being arranged in a line that extends in a direction generally parallel to the pad travel path along a length of the planarizing medium; and

the at least one viewing port in the backing pad comprises a slot through the backing pad that extends in the direction generally parallel to the pad travel path in alignment with the plurality of holes.

54. (New) The polishing pad of claim 52 wherein:

the at least one viewing port in the planarizing medium comprises a plurality of holes through the planarizing medium, the holes being arranged in a line that extends in a direction generally parallel to the pad travel path along a length of the planarizing medium; and

the at least one viewing port in the backing pad comprises a plurality of orifices through the backing pad, each orifice in the backing pad being aligned with a corresponding hole through the planarizing medium.

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55. (New) A polishing pad for chemical-mechanical planarization of microelectronic-device substrate assemblies, comprising:

an optically transmissive backing sheet having a top surface and an under surface; and

a planarizing medium disposed on the top surface of the backing sheet, the planarizing medium having at least one viewing port configured to be aligned with the illumination site in the table.

56. (New) The polishing pad of claim 55 wherein the viewing port in the planarizing medium comprises a plurality of holes through the planarizing medium, the holes being arranged in a line that extends in a direction generally parallel to the pad travel path along a length of the planarizing medium.

57. (New) A planarizing machine for mechanical or chemical-mechanical planarization of microelectronic-device substrate assemblies, comprising:

a table including a support surface having a first dimension extending along a pad travel path, a second dimension transverse to the first dimension and a planarizing at zone at least within the first and second dimensions;

a light source under to the table at an illumination site from which a light beam can emanate from the support surface of the table;

a polishing pad moveably coupled to the support surface of the table, the pad including a planarizing medium and an optical pass-through system, wherein the planarizing medium includes a planarizing surface configured to engage a substrate assembly and a backside to face towards the table, and wherein the optical pass-through system includes a plurality of

view sites along a length of the pad in a direction generally parallel to the pad travel path, each view site providing an optically transmissive path through the pad;

a pad advancing mechanism engaged with the pad, the advancing mechanism being configured to move the pad over the table along the pad travel path to place a fresh portion of the planarizing surface at one side of a planarizing zone on the table and to remove a worn portion of the planarizing surface from an opposite side of the planarizing zone; and

a carrier assembly having a head for holding a substrate assembly and a drive assembly connected to the head to move the substrate assembly with respect to the polishing pad.

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58. (New) The polishing pad of claim 57, further comprising:

an optically transmissive backing sheet having a top surface and a under surface, the planarizing medium being disposed on the top surface;

a backing pad attached to the under surface of the backing sheet; and

wherein the optical pass-through system comprises at least one opening in the planarizing medium alignable with the illumination site on the table and at least one orifice in the backing pad at least partially aligned with the opening in the planarizing medium.

59. (New) The polishing pad of claim 57 wherein the optical pass-through system comprises a plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, each hole being separately alignable with the illumination site according to the portion of the pad over the illumination site.

60. (New) The polishing pad of claim 57, further comprising an optically transmissive backing sheet having a top surface and an under surface, the planarizing medium being disposed on the top surface of the backing sheet, and wherein the optical pass-through system comprises a plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, each hole defining a separate view site.

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61. (New) The polishing pad of claim 57, further comprising an optically transmissive backing sheet having a top surface and an under surface, and wherein the planarizing medium is an abrasive layer having a resin and abrasive particles distributed in the resin, the planarizing medium being disposed on the top surface of the backing sheet.

62. (New) The polishing pad of claim 61 wherein the optical pass-through system comprises an elongated slot through the planarizing medium and extending along the length of the planarizing medium in the direction generally parallel to the pad travel path to divide the planarizing medium into a first section and a second section.

63. (New) The polishing pad of claim 61 wherein the optical pass-through system comprises a plurality of holes through the planarizing medium arranged in a line along the length of the planarizing medium in the direction generally parallel to the pad travel path, each hole being alignable with the illumination site as the pad incrementally moves over the table.

64. (New) A planarizing machine for mechanical or chemical-mechanical planarization of microelectronic-device substrate assemblies, comprising:

a table including a support surface having a first dimension extending along a pad travel path, a second dimension transverse to the first dimension and a planarizing at zone at least within the first and second dimensions;

a light source attached to the table at an illumination site from which a light beam can emanate from the support surface of the table;

a polishing pad moveably coupled to the support surface of the table, the pad including an optically transmissive backing sheet having an under surface facing the table and a top surface, the pad also including a planarizing medium disposed on the top surface of the backing sheet, and the planarizing medium having at least one opening configured to be aligned with the illumination site in the table;

a pad advancing mechanism engaged with the pad, the advancing mechanism configured to move the pad over the table along the pad travel path to place a fresh portion of the planarizing surface at one end of a planarizing zone on the table and to remove a worn portion of the planarizing surface from an opposite end of the planarizing zone; and

a carrier assembly having a head for holding a substrate assembly and a drive assembly connected to the head to move the substrate assembly with respect to the polishing pad.

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